

P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Advanced trench cell design
- ☒ Low Thermal Resistance

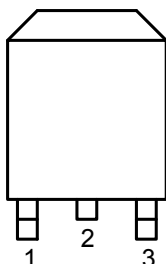
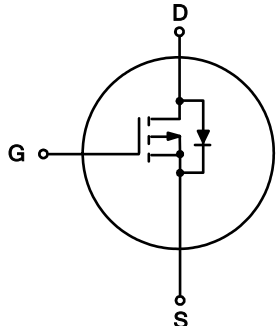
1.2 Applications

- ☒ Motor driver
- ☒ DC - DC Converter

1.3 Quick reference

- ☒ $BV \geq -60\text{ V}$
- ☒ $R_{DS(ON)} \leq 55\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- ☒ $P_{tot} \leq 35\text{ W}$
- ☒ $R_{DS(ON)} \leq 66\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- ☒ $I_D \leq -25\text{ A}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View TO252	
2	Drain(D)		
3	Source(S)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-60	-	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	± 20	V
I_D^*	Drain Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	-25	A
$I_{DM}^{*,***}$	Pulsed Drain Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	-40	A
P_{tot}^*	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	-	35	W
T_{stg}	Storage Temperature		- 55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}$	-	-25	A
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	1.2	$^{\circ}\text{C} / \text{W}$
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	37	$^{\circ}\text{C} / \text{W}$

Notes :

- * Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$
- ** Pulse width $\leq 10\text{ }\mu\text{s}$, duty cycle $\leq 1\%$
- *** Limited by bonding wire

4. Marking Information

Product Name	Marking
N25P06K	25P06 YWWXXX YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
N25P06K	TO252			2500	

6. Electrical Characteristics (T_C = 25 °C Unless Otherwise Noted)

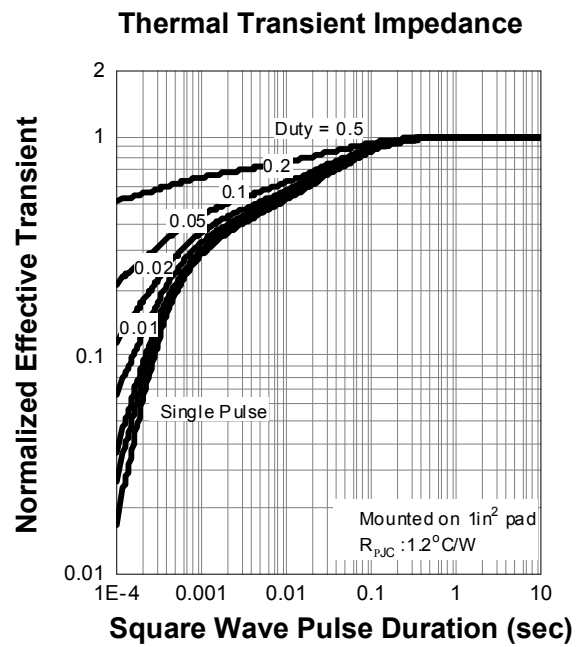
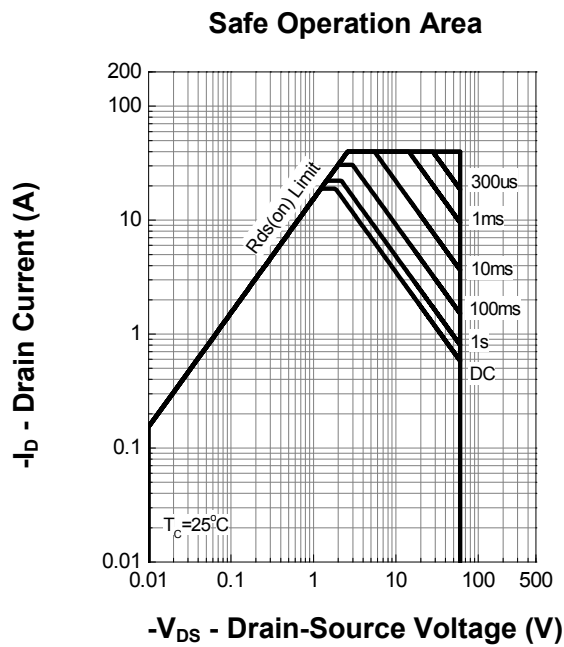
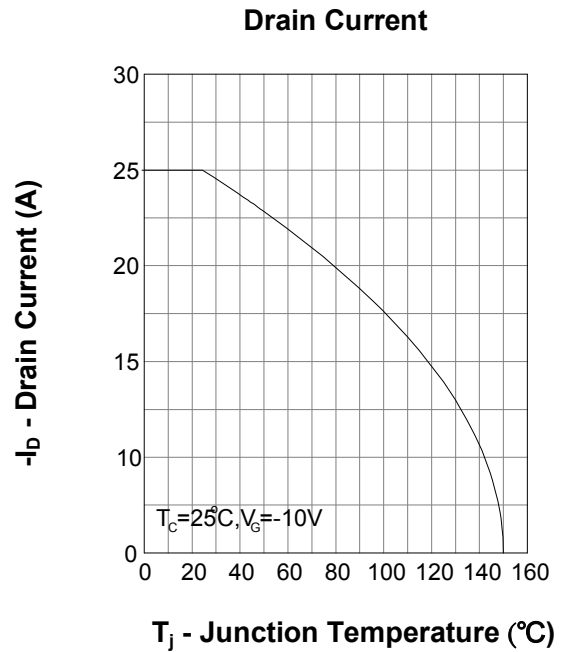
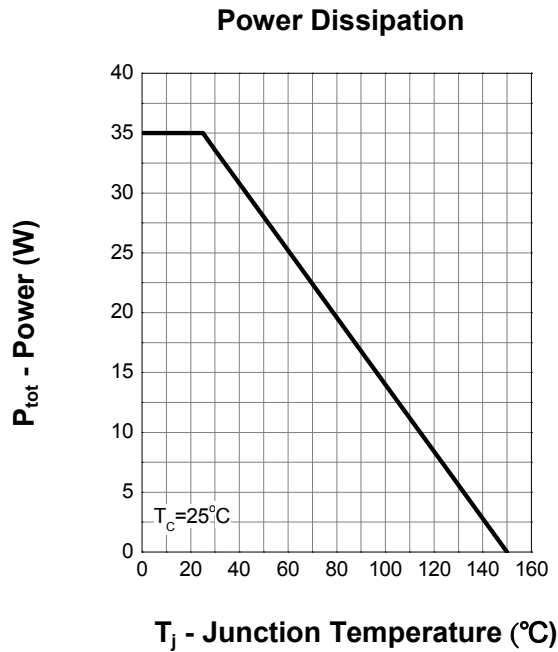
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = -250 μA	-60	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = -250 μA	-1.0	-	-2.0	V
I _{DSS}	Drain Leakage Current	V _{DS} = -48 V, V _{GS} = 0 V	-	-	-1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 20 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	Channel On-State Resistance	V _{GS} = -10 V, I _D = -10 A	-	50	55	mΩ
		V _{GS} = -4.5 V, I _D = -5 A	-	60	66	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = -10 A, V _{GS} = 0 V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} = -10 A, dI _{SD} / dt = 100 A / μs	-	25	-	Ns
Q _{rr}	Reverse Recovery Charge		-	7.5	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = -30 V Frequency = 1 MHz	-	1408	-	pF
C _{oss}	Output Capacitance		-	64	-	
C _{rss}	Reverse Transfer Capacitance		-	47	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = - 30 V, V _{GEN} = - 10 V, R _G = 4.5 Ω, R _L = 3 Ω, I _{DS} = - 10 A	-	14	-	nS
t _r	Turn-on Rise Time		-	51	-	
t _{d(off)}	Turn-off Delay Time		-	197	-	
t _f	Turn-off Fall Time		-	112	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{GS} = - 10 V, V _{DS} = - 30 V, I _{DS} = - 10 A	-	23	-	nC
Q _{gs}	Gate-Source Charge		-	6.5	-	
Q _{gd}	Gate-Drain Charge		-	3	-	

Notes :

a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

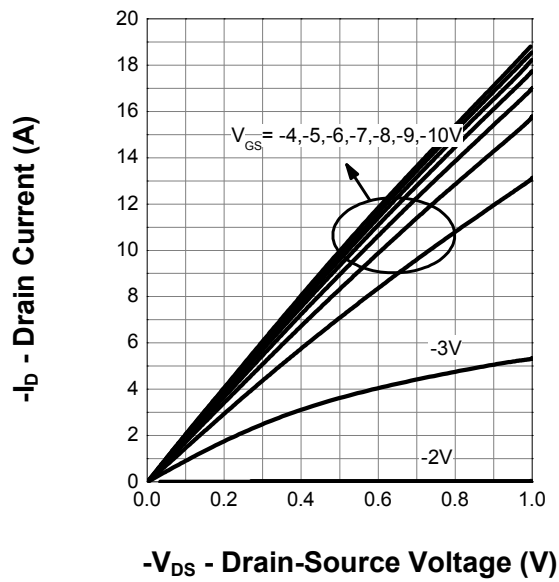
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

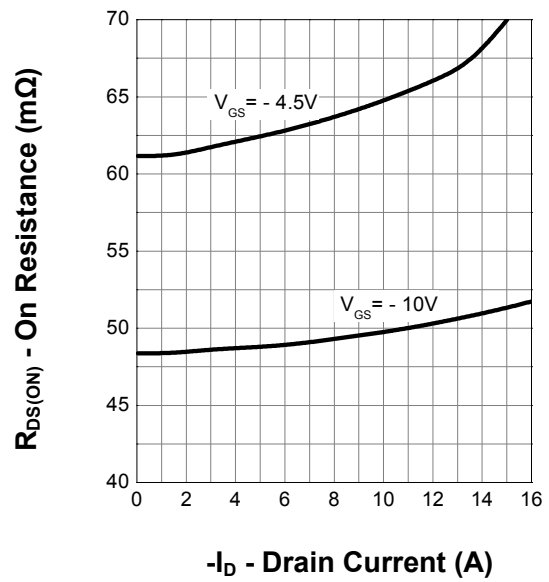


7. Typical Characteristics (cont.)

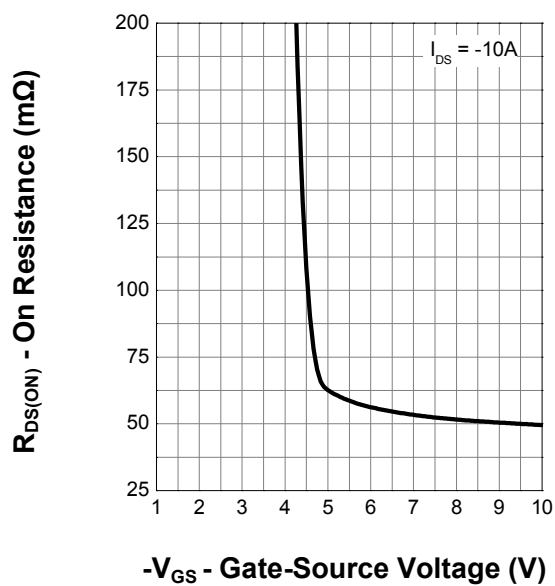
Output Characteristics



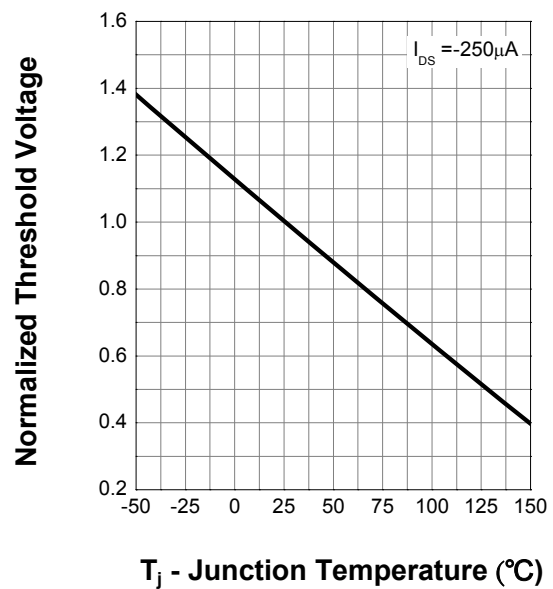
Drain-Source On Resistance



Transfer Characteristics

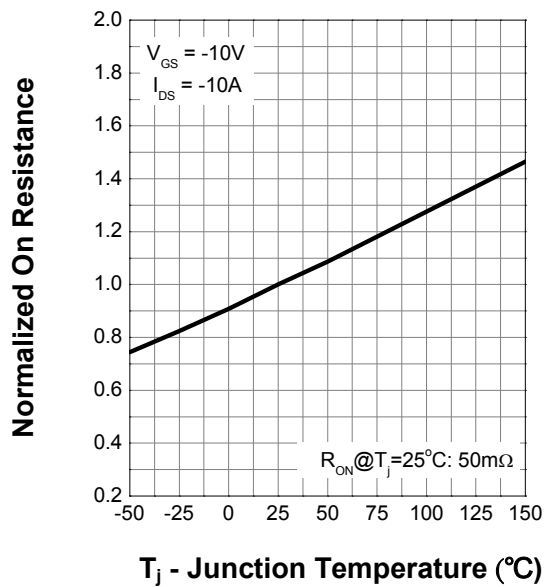


Gate Threshold Voltage

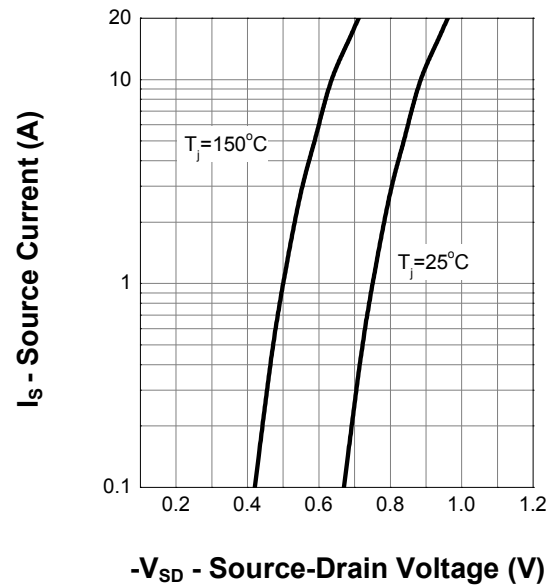


7. Typical Characteristics (cont.)

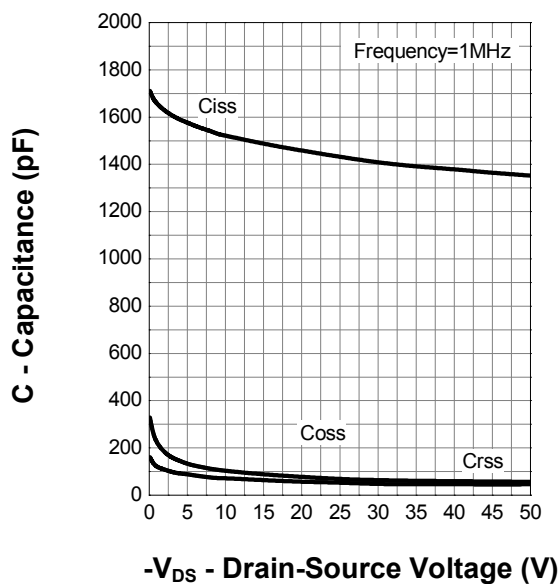
Drain-Source On Resistance



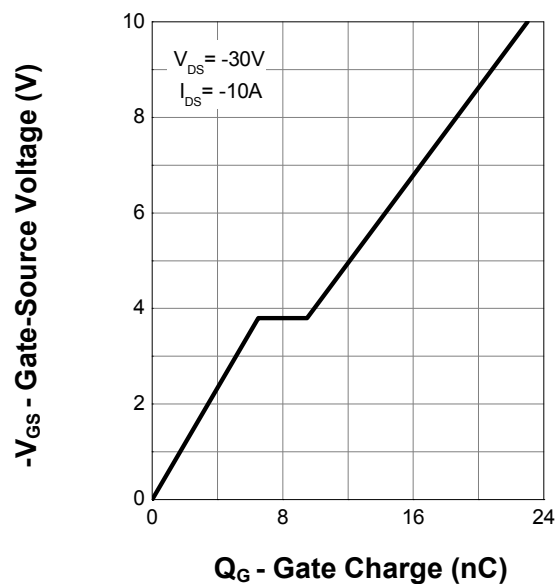
Source-Drain Diode Forward



Capacitance

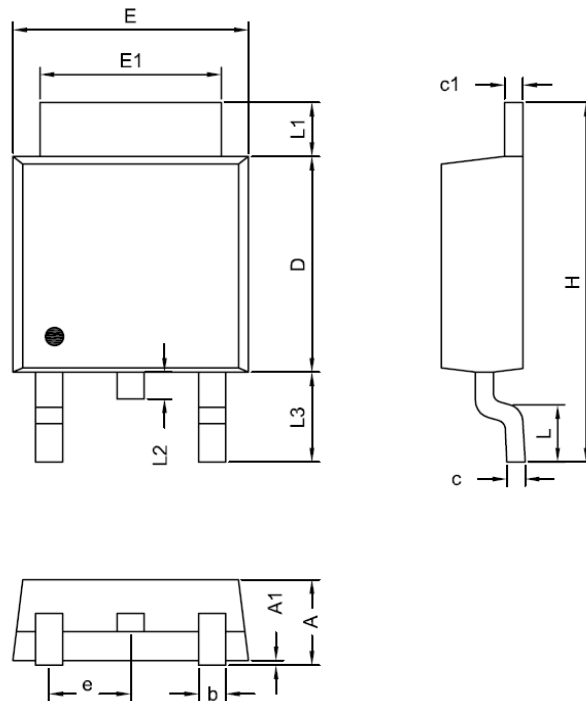


Gate Charge



8.Package Dimensions

TO252-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
c	0.40	0.60
c1	0.40	0.60
b	0.55	0.85
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40

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